IN THE SPECIFICATION

Please enter the following Amendments:

ON PAGE 1 IN THE PARAGRAPH BEGINNING IN LINE 16 AND CARRYING OVER TO PAGE 2:

As a very relevant non-limiting example to which the present invention can be beneficially applied, it is disclosed that fabrication of MOSFET Transistors requires formation of a Gate Structure on a Semiconductor Substrate. Typical practice is to use Silicon as the Semiconductor Substrate, grow thermal SiO_2 on its surface, (which is a dielectric material), and then apply metal atop thereof to form said Gate Structure. When Gate SiO_2 thickness is below about 100 Angstroms, however, it becomes leaky and is subject to breakdown at too low of voltages applied to the metal. Investigation of deposited materials, other than SiO_2 onto the Semiconductor for use as the dielectric material in Gate Structures, is therefore being pursued. However, control of the properties of the dielectic material formed during a fabrication proceedure ~~are~~ is sensitive to changes in the procedure, which changes are often difficult to detect and control. The present invention recognizes this fact and the fact that the first step in developing repeatability in fabrication is developing the ability to accurately monitor Gate dielectric materials. Methodology which enables accurate monitoring of materials allows identification of deviations from optimum which can be correlated to what are often subtle changes in fabrication procedure parameters, which subtle fabrication procedure changes are not readily obvious unless it is known to specifically look for their

presence as a result of detected deviations from intended fabrication end-results.

ON PAGE 3 IN THE PARAGRAPH BEGINNING IN LINE 20:

Patents which discuss monitoring ~~wittness~~ witness samples are:

Patent No. 6,278,809 to Johnson et al.;
Patent No. 5,871,805 to Lemelson[[;]].

ON PAGE 4 IN THE PARAGRAPH BEGINNING IN LINE 11:

For insight, it is noted that thin film characterizing spectroscopic data can be obtained by causing a beam of electromagnetic radiation which comprises a multiplicity of wavelengths, to interact with, via reflection from or transmission through said thin flim, and then enter a detector which provides intensity data vs. wavelength as output. Where ellipsometry is applied the data is obtained by causing a beam of electromagnetic radiation, which comprises a multiplicity of wavelengths to, after having a polarization state imposed thereupon by a polarizer, interact via reflection from or transmission through said thin flim, pass through an analyzer and then enter a detector which provides intensity data vs. wavelength as output. Optionally, a compensator can be present in the beam pathway between the polarizer and analyzer, or a modulation element can be present in the path of the beam. Where ellipsometric data is obtained the present invention methodology can be practiced using any type of Ellipsometer, including those which provide that a Polarizer and/or Analyzer and/or Compensator rotate during data acquisition, and those which provide that the beam be modulated.

ON PAGE 8 IN THE PARAGRAPH BEGINNING IN LINE 12:

Another example of the disclosed invention method provides that where a thin film being formed on a sample substrate is to be monitored during its formation, a witness sample is also provided onto which the same thin film is formed. The witness sample is monitored and results obtained thereform are used to characterize the thin film on the sample substrate. Importantly, the witness sample need not be of the same composition as is the sample substrate. In fact, it has been found very beneficial to intentionally provide a witness sample which comprises a thick dielectric, (eg. greater than about 250 Angstroms and preferably greater than 1000 Angstronms), onto which the thin film is deposited. It is found that a very beneficial method for evaluating thickness of an ultrathin film then comprising the steps of:

ON PAGE 11 IN THE PARAGRAPH BEGINNING IN LINE 21:

Fig. 10 shows ~~resluts~~ results similar to those in Fig. 9, but for the case where 10 Angstroms of Amorphous Carbon (a-Carbon) are substituted for the Amporphous Silicon (a-Si).

ON PAGE 16 IN THE PARAGRAPH BEGINNING IN LINE 18 AND CONTINUING ON TO PAGE 17:

It is acknowledged that Fig. 8 is difficult to interpret, and a prefered appraoch to displaying the data it contains is to calculate an RMS value which is calculated as:

$$\sqrt{\frac{\left(N_f-N_0\right)^2+\left(C_f-C_0\right)^2+\left(S_f-S_0\right)}{3}}$$

where "o" identifies data corresponding to when no thin film is present on the thick Oxide, and "f" identifies data corresponding to when thin film is present on the thick Oxide. (It is noted that "o" and "f" could also correspond to data obtained from two samples). Fig. 9 plots the RMS values for the cases of Figs. 5 - 8. Note that the data corresponding to Fig. 8 demonstrates an RMS sensitivity 20 times that of the data correspoinding to Figs. 5 - 7. Fig. 10 shows ~~resluts~~ results similar to those in Fig. 9, but for the case where 10 Angstroms of Amorphous Carbon (a-Carbon) are substituted for the Amporphous Silicon (a-Si).

ON PAGE 13 IN THE PARAGRAPH BEGINNING IN LINE 9:

It is another purpose and/or objective of the disclosed invention to teach that superior results can often be achieved by working with ~~parametrs~~ parameters derived from PSI (Ψ) and DELTA (Δ), which are known in the literature as N, C and S, said parameters being:

ON PAGE 14 IN THE PARAGRAPH BEGINNING IN LINE 30 AND CONTINUING ON TO PAGE 15:

While Figs. 1 - 4 demonstrate the possibility of using a Difference in Spectra obtained from two samples, or perhaps from one sample at different times during fabrication, it is often the case that a simple subtraction of PSI (Ψ) and/or DELTA (Δ) Spectra provides less than optimum results. In that light it is disclosed that it the disclosed invention

method teaches that superior results can often be achieved by working with ~~paramettrs~~ parameters derived from PSI (Ψ) and DELTA (Δ), which are known in the literature as N, C and S, said parameters being:

ON PAGE 13 IN THE PARAGRAPH BEGINNING IN LINE 21:

It is another purpose and/or objective yet of the disclosed invention to teach determination of optical constants of ultrathin absorbing films on ~~wittness~~ witness samples which have a relatively thick layer of optically transparent material.

ON PAGE 15 IN THE PARAGRAPH BEGINNING IN LINE 20:

To demonstrate the benefit of using N, C and S parameters in the method of the disclosed invention, an example involving obtaining data from a ~~wittness~~ witness sample which is monitored during deposition of a thin film will be described. This scenario might be encountered, for instance, during Gate metal deposition in a MOSFET fabrication step. Before presenting said example, it is noted that a problem with monitoring deposition of ultra-thin films onto MOSFET Gate Insulators using ellipsometry, is that ellipsometry is not always sensitive to the thickness of ultra-thin films on transparent dielectric material which is less than about 100 Angstroms deep. Where a witness sample is monitored, however, it can comprise a transparent dielectric material layer which is much thicker, (eg. 5000 Angstroms). The methodology of the disclosed invention enables very sensitive monitoring of ultra-thin layers of material deposited onto thick underlying transparent dielectric material.

ON PAGE 13 IN THE PARAGRAPH BEGINNING IN LINE 24:

Other purposes and/or objectives yet of the disclosed invention will become ~~appearant~~ apparent from a reading of the Specification and Claims.

ON PAGE 16 IN THE PARAGRAPH BEGINNING IN LINE 2:

Turning now to Figs. 5 - 8, there are shown N, C and S spectra for the case of no film, (solid lines), and for the case where 10 Angstroms of Amorphous Silicon (a-Si), (dashed lines), are deposited on, respectively, a Tantalum Metal Substrate (Fig. 5); on a Silicon Substrate with 20 Angstroms of Native Oxide (Fig. 6); on a Silicon Substrate with 250 Angstroms of Thermal Oxide (Fig. 7); and on a Silicon Substrate with 5000 Angstroms of Oxide present (Fig. 8). Note that while the dashed line are shifted from the solid lines in Figs 5 - 7, only Fig. 8 shows significant ~~osciilatiens~~ oscillations caused by deposition of 10 Angstroms of a-Si. That is, surprizingly, use of a Witness Sample which comprises thick Oxide at its Surface, greatly enhances the ability of ellipsometry to detect the presence of a 10 Angstrom film deposited thereonto.

ON PAGE 16 IN THE PARAGRAPH BEGINNING IN LINE 18:

It is acknowledged that Fig. 8 is difficult to interpret, and a prefered ~~appraech~~ approach to displaying the data it contains is to calculate an RMS value which is calculated as: